

Test Lab Work Request Form

Date Submitted: 10 March, 2000	Tracking #: TLW 0010H
Project #: 241095	Engineer: J.R.SNEDEKER
Test Objective: TLW0010H - Measure Bolt Lift and Bolt Closing Forces: The force required opening the bolt and closing the bolt will be measured for each sample. Both of these forces will be taken with the chamber empty and then repeated, this time with a new dummy round in the chamber. There is not a specification for these forces and the readings will be taken for information only.	
Test Description: Method: - After locating the rifle in the trigger pull fixture and securely locking in place, (it may be necessary to clamp the fixture to the bench if not already securely fixed in place), locate the hook of the force gauge at the point on the bolt handle just behind the ball. - With the chamber empty and using the Chatillion gauge, pull the gauge straight up and perpendicular to the bore, measure the force required to open the bolt. - Lock the firearm in a horizontal position, using the trigger pull holding fixture, (i.e. shooting position) before taking the measurements. - Take three readings for each gun in the sample. - Record all readings. - Repeat the procedure only this time push the bolt closed. - Note that it may be necessary to start the bolt closed by hand so the firing pin head is depressed sufficiently out of the notch and can start up the cam surface of the bolt as the firing pin is cocked. - Repeat the above procedure this time with a new, unused dummy round in the chamber.	
Data Required: - Rifle serial number - Each of the three readings taken for each of the 4 states for each test sample - The average of each set of three measurements per state	
Resource Usage: Manpower Requirements - Facility Requirements -	Test Results Required: Formal Report: Data Only: X REQUESTED Completion Date:
Required Materials/Parts/Equipment (include quantities):	
Test Parts Availability Date:	
Start Date: 13 Sept 2000 Completion Date: 13 Sept 2000 Report Date:	Test Assigned To: <i>U. Cassin</i>

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Bolt Lift and Close Forces - TLW0010H

	Forward Close	Down Close	Up Force	
B1	41.90/39.68/39.26 ^{40.28}	2.62/2.30/4.14 3.02	4.80/5.22/5.22 ^{5.08}	1074
B2	48.50/47.68/46.20 ^{47.46}	3.00/2.80/2.92 2.91	3.14/3.02/3.18 ^{3.11}	1346
B3	47.20/39.46/43.74 ^{43.47}	2.48/2.60/2.44 2.51	2.80/2.80/3.00 ^{2.87}	1070
B4	43.98/46.58/42.56 ^{44.37}	2.44/2.64/2.40 2.49	3.38/2.96/3.02 ^{3.42}	1338
B5	Could not measure - Broken bolt handle.			840
B6	43.30/37.08/41.88 ^{40.75}	2.92/3.16/2.86 2.98	2.30/2.62/2.98 ^{2.63}	1328
B7	50.24/46.94/46.42 ^{47.87}	2.42/2.34/2.46 2.41	2.82/3.36/3.00 ^{3.06}	1333
B8	53.14/51.92/49.52 ^{51.53}	3.34/2.82/2.04 2.73	2.42/2.62/2.54 ^{2.53}	1083
B9	44.66/40.09/43.78 ^{42.81}	2.28/2.20/2.20 2.23	2.50/2.42/2.36 ^{2.43}	1063
B10	46.60/43.28/43.74 ^{44.54}	3.22/2.46/4.14 3.27	4.80/5.22/5.22 ^{5.08}	1069

All Forces measured in Lbs.

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Gun	Safe		Bolt Closing		¹ Bolt Opening Up Load (lbs.)	Magazine Load @ .2" (lbs.)	Magazine Load @ 1" (lbs.)	² Overall Weight (lbs.)	Bolt Ass'y Weight (lbs.)	Barrel Ass'y Weight (lbs.)
	Off Force (lbs.)	On Force (lbs.)	Forward Load (lbs.)	Down Load (lbs.)						
B-1	2.86	5.78	40.28	3.02	5.08	1.74	2.73	6.916	0.654	3.867
B-2	2.65	6.13	47.46	2.91	3.11	1.87	2.94	6.881	0.653	3.841
B-3	2.52	5.99	43.47	2.51	2.87	1.74	2.71	6.891	0.655	3.844
B-4	1.93	4.78	44.37	2.49	3.12	1.83	2.92	6.893	0.654	3.853
B-5	2.11					1.98	2.95	6.899	0.655	3.857
B-6	2.61	5.35	40.75	2.98	2.63	1.84	2.86	6.905	0.654	3.863
B-7	2.87	6.45	47.87	2.41	3.06	2.00	3.11	6.897	0.654	3.857
B-8	2.05	5.86	51.53	2.73	2.53	1.93	2.94	6.874	0.653	3.837
B-9	2.79	5.63	42.81	2.23	2.43	2.18	3.67	6.889	0.654	3.856
B-10	2.99	5.84	44.54	3.27	5.08	1.88	2.98	6.900	0.655	3.861
AVERAGE	2.54	5.76	44.79	2.73	3.32	1.90	2.98	6.895	0.654	3.854
MAX.	2.99	6.45	51.53	3.27	5.08	2.18	3.67	6.916	0.655	3.867
MIN.	1.93	4.78	40.28	2.23	2.43	1.74	2.71	6.874	0.653	3.837
Std. Dev.	0.38	0.48	3.62	0.34	1.03	0.13	0.27	0.012	0.001	0.010

¹ Did not fire gun before opening.

² Overall weight with no magazine box. (All taken for End. Testing)

³ Measured from muzzle.

⁴ SAAMI requirement is 40 lbs.

Note: Weight of 1 Magazine box = .215 lbs.

SCROLL TO SEE ADDITIONAL MEASUREMENTS

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Stock Weight (lbs.)	Take Down Screw Wt. (lbs.)	Firearm Overall Length (in.)	Barrel Length (in.)	Length Of Pull (in.)	³ Balance Pt. Empty (in.)	³ Balance Pt. Loaded (in.)	Drop at Comb (in.)	Drop at Heel (in.)	Drop at Toe (in.)	50 Lb. Trigger Trigger Pull Before (lbs.)
2.354	0.042	41.750	22	13.25	21.9375	22	1.246	1.417	6.278	5.00
2.345	0.042	41.750	22	13.26	21.9375	22	1.300	1.406	6.295	5.08
2.351	0.042	41.750	22	13.25	21.9375	22	1.305	1.398	6.305	4.58
2.344	0.042	41.750	22	13.25	21.9375	22	1.305	1.401	6.306	4.92
2.346	0.042	41.812	22	13.24	21.875	22	1.295	1.404	6.279	
2.347	0.042	41.812	22	13.25	21.875	22	1.305	1.392	6.289	4.92
2.344	0.042	41.750	22	13.24	21.9375	22	1.305	1.391	6.297	4.42
2.343	0.042	41.750	22	13.25	21.9375	22	1.296	1.391	6.292	5.33
2.338	0.042	41.750	22	13.23	21.875	22	1.314	1.415	6.310	4.83
2.343	0.042	41.812	22	13.25	21.875	22	1.298	1.407	6.308	5.17
2.346	0.042	41.769	22	13.25	21.913	22	1.297	1.402	6.296	4.92
2.354	0.042	41.812	22	13.26	21.938	22	1.314	1.417	6.310	5.33
2.338	0.042	41.750	22	13.23	21.875	22	1.246	1.391	6.278	4.42
0.004	0.000	0.030	0	0.01	0.032	0	0.019	0.009	0.012	0.28

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Trigger Pull Test	50 Lb. Trigger Pull Test		50 Lb. Trigger Pull Test		50 Lb. Trigger Pull Test		Magazine Capacity
Trigger Pull After (lbs.)	Engagement Before (in.)	Engagement After (in.)	Trigger Gap Before (in.)	Trigger Gap After (in.)	Fire During Safe Release	Fire After Trigger Pull	Test
5.08	0.0276	0.0293	0.162	0.140	NO	YES	OK
5.25	0.0282	0.0287	0.163	0.132	NO	YES	OK
4.92	0.0251	0.0263	0.166	0.124	NO	YES	OK
4.75	0.0280	0.0279	0.165	0.123	NO	YES	OK
4.75	0.0280	0.0301	0.166	0.136	NO	YES	OK
4.75	0.0282	0.0307	0.167	0.136	NO	YES	OK
5.00	0.0299	0.0282	0.168	0.149	NO	YES	OK
4.50	0.0304	0.0290	0.161	0.128	NO	YES	OK
5.17	0.0265	0.0281	0.165	0.128	NO	YES	OK
4.91	0.0280	0.0287	0.165	0.133			
5.25	0.0304	0.0307	0.168	0.149			
4.50	0.0251	0.0263	0.161	0.123			
0.24	0.0016	0.0013	0.002	0.008			

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Williams v. Remington